



Galt Traffic

The Official News Letter of Galt Airport and EAA Chapter 932

Mission: 'Be fruitful and multiply and fill the sky and subdue it'



This month's Feature Article: In Search of the Perfectly Safe Airplane

In Search of the Perfectly Safe Airplane

Believe it or not, the search for the perfectly safe airplane predates the actual invention of the airplane. I know, that sounds like a pretty bold statement, but let me give just one example to illustrate my point. The

Wright Brothers were not the only ones working on the problem of powered flight in the late 19th and early 20th centuries. As you probably already know, Samuel Langley was one of the most widely publicized. There is even published communication (letters, a very primitive form of email) in which Langley and the Wrights discussed such things as amount of lift and thrust required to achieve powered flight.

Back to my point. Langley was of the opinion that operating in the third dimension was really beyond the physical limits of the human nature. In his conceptualization of powered flight, the aircraft must be inherently stable to prevent the pilot from doing something stupid (like exceeding the critical angle of attack) and causing an accident. His answer was to build the aircraft heavy and stable. His design required significantly more thrust to become and stay airborne than that of the Wrights. The Wrights chose a light weight design that required less thrust but gave up stability in exchange. The Wright aircraft therefore required a control system and a pilot with the knowledge to use it. This led to the glider experiments at Kitty Hawk. In these experiments the Wrights perfected their control system and practiced using it on tethered and eventually free gliders. In the process they did experience a few accidents with some minor injuries and property damage.

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In the years since the success of the Wright Brothers, the struggle between inherent stability and less stability with more controllability has continued unabated. One of the better known manifestations of this struggle was the creation of the ERCO Ercoupe in the late 1930's by the legendary Fred Weick. For those of you who have never flown one of these aircraft, which has no rudder pedals, I strongly recommend that you seek out an opportunity to do so. It is also worthy of note that the later models of this aircraft could be ordered with rudder pedals, and as the type certificate was sold and resold the final models of this unique aircraft were only available with rudder pedals. This conflict between performance and safety (stability) is not limited to GA. Two warbirds come immediately to mind. One the Lockheed F-104 Shooting Star had performance capabilities only recently achieved again. The F-104 was a 1950's design. The same could be said about the Convair B-58 Hustler.

So why were these aircraft retired before an aircraft of comparable performance was ready to step in and replace them? It was because although they were controllable, they were so unstable that the flying skills required were significantly beyond the capabilities of most pilots. So how can we fly aircraft with similar performance today?

The simple answer is, autopilots with



envelope protection. Warbirds started using this technology, in its earliest forms in the 1960's. This technology is working its way down to us. The earliest attempt at this that I personally recall was by

Mooney in the mid 1960's. That system was essentially a single axis autopilot that was



always on. In order to make a turn, the pilot needed to depress a button on the yoke. That system was called "Positive Control" or "PC" for short.

I think "envelope protection" is likely to become something you will hear much more frequently in the next few years because both Avidyne and Garmin are developing envelope protecting autopilots. Garmin's system has 2 modes. One is active when the autopilot is engaged and the other, called

ESP (for electronic

stability and protection) is active when the pilot is hand

flying. As ESP uses the autopilot computers and servos, it is really an "always on" mode of the autopilot. ESP does not prevent wild excursions—it just adds a restoring force to the controls so that the pilot has to exert an extra effort to go past, for example, a certain bank angle. If the aircraft attitude is outside of predefined normal limits, either because of intentional actions by the pilot or because of an upset, ESP will work to re-establish the aircraft within those normal limits. Once back in the envelope, the system goes dormant. The system is designed to prevent, among other things, development of a graveyard spiral. ESP will reduce the bank angle to 30° (actual values are installation-dependent) and pitch the nose up so that it is higher than 20° nose down. The pilot should then be able to complete the recovery without further assistance. If, on the other hand, the pilot is still disoriented or otherwise not in effective control, the autopilot engages to return the aircraft to straight-and-level. Another trap is an underspeed. A typical situation might be a descent (as part of an approach) followed by a leveling off. If the pilot forgets to add power, the aircraft will obviously slow down. As the aircraft nears the stall, the system will initiate a slow descent to at least keep a small margin above the stall. The philosophy here is that, if the pilot is incapacitated, it is better to hit the ground at low speed with the wings level than it is to hit the ground in a spin as the result of a stall. This system is currently available on aircraft with G1000 systems with GFC700 autopilots, such as KingAirs and Citation Mustangs, but you have to wonder how soon will it be available for Bonanza and Mooney owners? In the mean time, I would love to hear about your experiences flying Ercoupe aircraft with no rudder pedals. Please send your experiences to editor@eaa932.org.

This article was assembled from various sources including Wikipedia and Professional Pilot Magazine. For a complete list of sources contact editor@eaa932.org.--Ed

A Funny Thing Happened On The Way To The Cockpit

Once upon a time in the 1950's a young family started to make a long trip by Volkswagen Beetle. This trip originated in northwestern Ohio with a planned destination of suburban Los Angeles California. I was only 5 years old at the time. My father was determined to set the transcontinental speed record for Volkswagen class vehicle. Approximately three hours after departure nature came calling. I leaned over the back of my father's seat and said, "Daddy I have to go to the bathroom; I really gotta go!"

He turned to look at me just long enough to say, "Now Michael, that's just one of those things you must learn to control." Over time I did learn to control the bladder. I learned it so well in fact that after running into a pilot I had not flown with (or even seen) in about 15 years, we reconnected. In the conversation that followed, he said two things stuck in his memory about flying with me: first, I always knew exactly where the ground was under a Boeing 727 in the landing flare, and second he had never seen anyone but me sit in the cockpit and drink coffee all the way across the Atlantic without once getting up to go to the bathroom! Fast forward another 10 or so years and my father asked if I could fly him to eastern Ohio so he could attend to some family business issues. Of course I said yes (any excuse to fly, right?) I had just trimmed the Gruman AA1B level at 7000 feet. My father tapped me on the shoulder and said, "Michael, I need a bathroom. I really gotta go!" I turned to look at him just long enough to say, "Now Virgil, that's just one of those things you must learn to control." There is a moral to this story, and it's this, Always be kind to your children; if you live long enough they will choose your nursing home!

I'm sure you have some funny flying stories to tell. Why not share them?

Please send them to editor@eaa932.org.



Are You As Smart As An Airline Pilot?



1. The maximum speed during takeoff that the pilot may abort the takeoff and stop the airplane within the accelerate-stop distance is
A) V_{EF} .
B) V_1 .
C) V_2 .
2. What is the name of an area beyond the end of a runway which does not contain obstructions and can be considered when calculating takeoff performance of turbine-powered aircraft?
A) Stopway.
B) Obstruction clearance plane.
C) Clearway.
3. What action is required prior to takeoff if snow is adhering to the wings of an air carrier airplane?
A) Add 15 knots to the normal V_R speed as the snow will blow off.
B) Sweep off as much snow as possible and the residue must be polished smooth.
C) Assure that the snow is removed from the airplane.

These questions are taken from the Airline Transport Pilot Exam. Answers at the end of this newsletter.

Better Seen From The Air

Mt Rushmore National Monument



Things To Do Near Mt Rushmore National Monument

- ◊ Custer State Park (Where the buffalo roam)
- ◊ A Black Hills Gold Mine
- ◊ Deadwood South Dakota (Always play poker with your back to the wall)
- ◊ Dinosaur State Park
- ◊ Crazy Horse Memorial
- ◊ South Dakota Air and Space Museum (Need we say more?)
- ◊ The Alpine Slide
- ◊ Fine Dining throughout the area
- ◊ Fly Fishing for Trout (My personal favorite)

I'm sure you have a favorite place to fly to. Why not share it?
Please send them to editor@eaa932.org.

Happening At 10C

The Flight School has been a busy place the last couple of months.

First Solo Flight:

8/8/16 Ken Loar
8/25/16 Dave Carlson

Sport Pilot Certificate:

9/3/16 Troy Coffman

Private Pilot Certificate:

8/1/16 Andrew DeZanek
8/16/16 Griffin Norton
8/24/16 Luis Castillo

Answers To
Are You As Smart As An Airline Pilot?

1. B
2. C
3. C

See You Next Month!--Ed